SYSTEM RELIABILITY PROCUREMENT

2021 YEAR-END REPORT

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Term	Definition
3V0	Ground Fault (or Zero Sequence) Overvoltage
AESC	Avoided Energy Supply Components
AMF	Advanced Metering Functionality
Approximate Value	The estimated net present value of deferring the wires investment for the required timeframe.
BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Ratio
BTM	Behind-the-Meter
Capex	Capital expenditure
CEM	Customer Energy Management
CHP	Combined Heat and Power
CLF	Conservation Law Foundation
CO_2	Carbon Dioxide
CRM	Cost Recovery Mechanism
CSA	Construction Service Agreement
C-Team	(EERMC) Consultant Team
DER	Distributed Energy Resource
DG	Distributed Generation
Division	Division of Public Utilities and Carriers
DPAM	Distribution Planning and Asset Management
DR	Demand Response
DRIPE	Demand Reduction Induced Price Effect(s)
DSP	Distribution System Planning
EE	Energy Efficiency
EE Plan	Energy Efficiency Program Plan
EEP	Energy Efficiency Program
EERMC	Energy Efficiency and Resource Management Council
EPC	Engineering, Procurement, and Construction
EPS	Electric Power System
ESA	Energy Service Agreement
ESS	Energy Storage System
EV	Electric Vehicle
FERC	Federal Energy Regulatory Commission
Framework	Rhode Island Docket 4600 Benefit-Cost Framework
FTE	Full-Time Employee/Equivalent
FTM	Front-of-the-Meter
GAME	Gas Asset Management and Engineering
GHG	Greenhouse gas

Term	Definition
GMP	Grid Modernization Plan
ISO	Independent Systems Operator
ISO-NE	ISO New England Inc.
ISR	Infrastructure, Safety and Reliability Plan
kW	Kilowatt
kWh	Kilowatt-hour
LCP	Least-Cost Procurement
MW	Megawatt
MWh	Megawatt-hour
NECEC	Northeast Clean Energy Council
NERC	North American Energy Reliability Corporation
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen Oxides
NPA	Non-Pipeline Alternatives
NPV	Net Present Value
NWA	Non-Wires Alternative
O&M	Operations and Maintenance
OER	Office of Energy Resources
Opex	Operational expenditure
PIM	Performance Incentive Mechanism
Portal	Rhode Island System Data Portal
PST	Power Sector Transformation
PUC	Public Utilities Commission
PV	Photovoltaic
RD&D	Research, Design, and Development
REC	Renewable Energy Credits
REG	Renewable Energy Growth
RFP	Request for Proposals
RGGI	Regional Greenhouse Gas Initiative
RI NWA BCA Model	Rhode Island Non-Wires Alternative Benefit-Cost Analysis Model
RI NWA BCA Model TRM	Rhode Island Non-Wires Alternative Benefit-Cost Analysis Technical Reference Manual
RI NPA BCA Model	Rhode Island Non-Pipeline Alternative Benefit-Cost Analysis Model
RI NPA BCA Model TRM	Rhode Island Non-Pipeline Alternative Benefit-Cost Analysis Technical Reference Manual
RI Test	Rhode Island Benefit-Cost Test
RNG	Renewable Natural Gas
RPS	Renewable Portfolio Standards
SME	Subject Matter Expert

Term	Definition
SO_2	Sulfur Dioxide
SRP	System Reliability Procurement
T&D	Transmission and Distribution
TWG	Technical Working Group
VVO	Volt-VAR Optimization

2021 SYSTEM RELIABILITY PROCUREMENT YEAR-END REPORT

1. Executive Summary

The purpose of System Reliability Procurement (SRP) is to identify targeted alternative solutions, through customer-side and grid-side opportunities, for the electric and gas distribution systems that are cost-effective, reliable, prudent and environmentally responsible and provide the path to lower supply and delivery costs to customers in Rhode Island.

The role of National Grid[1] with respect to SRP is to identify potential Non-Wires Alternative (NWA) and Non-Pipeline Alternative (NPA) opportunities, to source viable alternative solutions that address system needs and defer, reduce, or remove the need for distribution wires and pipes investments, and to support projects and programs that enable such activity.

The Company summarizes the rulings requested of the Rhode Island Public Utilities Commission (PUC) in the table below. Note that no funding requests are associated with these proposals because SRP Year-End Reports are purposed for programmatic proposals only and not financial investment proposals.

Table 1: Summary of Requested Rulings for SRP

SRP Section	SRP Initiative/Proposal	Requested Ruling
4	RI NWA BCA Model	The Company requests approval of the proposed revision to the RI NWA Benefit-Cost Analysis (BCA) Model.
8.2	RI NPA Screening Criteria	The Company requests approval of the proposed revisions to the NPA Screening Criteria for Rhode Island as detailed in Section 8.2 for calendar years 2021 through 2023.

The commitments presented in this 2021 SRP Year-End Report and from the prior 2020 SRP Year-End Report of Docket No. 5080[2] are summarized in the following table with year-over-year progress indicated in the rightmost column. These commitments do not require additional, incremental SRP funding because they are actions covered by the work of full-time employees (FTEs).

[1] The Narragansett Electric Company d/b/a National Grid (National Grid or Company).

[2] Docket No. 5080." *State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers*, The Narragansett Electric Company d/b/a National Grid, 20 Nov. 2020, www.ripuc.ri.gov/eventsactions/docket/5080page.html.

Table 2: Summary of 2021 SRP Commitments

SRP Commitment	Status
The Company plans to continue analyzing its current NWA screening and development processes to determine how NWAs might be best considered as both complete and partial solutions.	Ongoing, dynamic process
The Company commits to produce a detailed initial NPA Program at the end of the 2021-2023 SRP Three-Year Plan cycle.	Ongoing, dynamic process
The Company plans to continue analyzing its current NPA screening and development processes to determine how NPAs might be best considered as both complete and partial solutions.	Ongoing, dynamic process
The Company commits to performing background research on NPAs and exploring how NPAs align with Company policy and the Least Cost Procurement Standards (LCP Standards) for the next update in the Three-Year Plan review.	Ongoing, dynamic process
The Company commits to engaging with stakeholders to discuss and understand opportunities and challenges regarding NPAs.	Ongoing, perpetual commitment
The Company intends to engage stakeholders continually throughout the development of the NPA program via SRP TWG meetings. The Company intends stakeholders to be engaged during the development of specific program parts.	Ongoing, perpetual commitment
Begin coordination work with the Company's proposed Grid Modernization Plan (GMP) regarding inclusion of hourly (8,760 hours) data in addition to peak load data once the Grid Modernization Plan with this update is approved for funding.	SRP to align with GMP
The Company recognizes that improved synchronization between SRP and Power Sector Transformation (PST), the Energy Efficiency Program Plan (EE Plan), the Infrastructure, Safety and Reliability Plan, the Grid Modernization Plan (GMP), and the Advanced Metering Functionality (AMF) Business Case is necessary and intends to improve coordination between these filings.	Ongoing, perpetual commitment
Therefore, the Company commits to continued stakeholder engagement and continued participation in enhanced discussions regarding SRP, NWA, and related policy and programs with stakeholders.	Ongoing, perpetual commitment

SRP Commitment	Status
The Company also commits to continue its efforts to actively avoid double-counting shareholder incentives in SRP programs and projects.	Ongoing, perpetual commitment
The Company intends to implement robust stakeholder engagement and discussion on the electric forecasting process.	Ongoing, perpetual commitment
The Company will commit to development and implementation of a data governance plan in coordination with the work on the AMF and GMP filings and will continue stakeholder engagement and discussion.	SRP to align with GMP

Note that the ongoing, perpetual commitments in the table above are ones that the Company has so far aligned and delivered on and intends to continue to achieve.

Stakeholder engagement and discussions to date are detailed in Appendix 7.

The proposals and information the Company presents in this SRP Plan advance Power Sector Transformation (PST)[3] goals, align with Docket 4600[4] principles, are coordinated with the Company's other programs and filings, and adhere to Least-Cost Procurement (LCP) law[5].

[3] "Power Sector Transformation Initiative." *State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers*, State of Rhode Island Office of the Governor Gina M. Raimondo, 8 Nov. 2017, www.ripuc.ri.gov/utilityinfo/electric/PST_home.html.

[4] "Docket No. 4600 and Docket No. 4600-A." *State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers*, Rhode Island Public Utilities Commission, 2 Nov. 2018, www.ripuc.ri.gov/eventsactions/docket/4600page.html.

[5] "39-1-27.7. System Reliability and Least-Cost Procurement." *TITLE 39 Public Utilities and Carriers* , State of Rhode Island General Assembly, http://webserver.rilin.state.ri.us/Statutes/title39/39-1/39-1-27.7.HTM.

2. Introduction

The Company is pleased to submit this 2021 System Reliability Procurement Year-End Report (Report) to the PUC. This Report has been developed by National Grid through an iterative process with the SRP Technical Working Group (the SRP TWG).[6]

This Report summarizes the work the Company has performed in the SRP Program for calendar year 2021.

National Grid respectfully submits this Report and seeks approval of its integral proposals in accordance with the guidelines set forth in Section 4 of the LCP Standards.

[6] Members of the SRP TWG presently include the Company, Acadia Center, CLF, the Division, Green Energy Consumers Alliance, OER, NECEC, Rhode Island Commerce, several EERMC members, and representatives from the EERMC's Consultant Team (EERMC C-Team).

3. Regulatory Basis for System Reliability Procurement

This Report is submitted in accordance with the regulatory basis detailed in the 2021-2023 SRP Three-Year Plan[7] and Section 4.4.B of the Rhode Island PUC's revised "Least-Cost Procurement Standards," which the PUC approved and adopted pursuant to Order No. 23890 in Docket No. 5015 (LCP Standards).[8]

Please see Sections 6.1 and 6.2 for detail on further alignment of the SRP program to the Standards with regard to the developing NPA program.

[7] "Docket No. 5080." *State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers*, The Narragansett Electric Company d/b/a National Grid, 20 Nov. 2020, www.ripuc.ri.gov/eventsactions/docket/5080page.html.

[8] "Least Cost Procurement Standards." *State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers*, Energy Efficiency and Resource Management Council, 21 Aug. 2020, http://www.ripuc.ri.gov/eventsactions/docket/5015_LCP_Standards_05_28_2020_8.21.2020%20Clean%20Copy%20FINAL.pdf.

4. SRP Budget Spend

This section details the calendar year spend for the SRP programs.

Table 3. SRP Budget Spend for CY 2021

Initiative/ Program	Program Detail	Budget Filed	Budget Spend
NWA	No specific NWA projects have been identified for proposal in CY 2021.	$0	$0
NPA	No specific NPA projects have been identified for proposal in CY 2021.	$0	$0
Rhode Island System Data Portal (Portal)	The Portal is an interactive online mapping tool developed by the Company. The Portal provides specific information for select electric distribution feeders and associated substations within the Company's electric service area in Rhode Island. The SRP Program handles new enhancements to the Portal.	$0	$0
SRP Market Engagement	SRP Market Engagement aims to raise awareness and perform outreach and engagement for the Rhode Island System Data Portal as needed, for NWA-related activities not covered by FTE work, and with third-party solution providers.	$0	$3,092
	Total	$0	$3,092

There was slight budget spend in the SRP Market Engagement category resulting from wrap-up in Q1 2021 of the RI Developer Portal Survey that occurred at the end of CY 2020. This $3,092 budget spend is still well within the remaining budget of approximately $57,409 from CY 2020. As no incremental costs are expected and no financial investment proposals are planned or projected for CY 2022, all remaining funds from SRP in the SRP fund balance have been reconciled back to the EE fund balance in December 2021.

5. RI NWA BCA Model

This section details the RI NWA BCA Model that the Company utilizes to assess cost-effectiveness of NWA projects.

The Company proposes the following minor change to the RI NWA BCA Model. No corresponding text updates were required in the RI NWA BCA Model Technical Reference Manual (TRM).

1. Correction of the formula for the "Lower than the Cost of the Standard Option" row series in the "Proposals Comparison" tab. The formula series was revised so that it correctly references the "Distribution Capital Cost" and "Transmission Capital Cost" inputs in the "Inputs-System" tab rather than the "Wires Option BCA Ratio" of the same tab.

This change was made in line with the identification and comment by the PUC in the Technical Session for Docket 5080 on July 26, 2021. This change allows for enhanced and accurate functionality in the RI NWA BCA Model.

Please see Appendix 4 for the updated RI NWA BCA Model.

The Company requests approval of the proposed revision to the RI NWA BCA Model.

6. RI NPA BCA Model

This section details the Rhode Island Non-Pipeline Alternative Benefit-Cost Analysis Model (RI NPA BCA Model) that the Company will utilize to assess cost-effectiveness of NPA projects.

Please see Appendix 5 for the initial version of the RI NPA BCA Model.

Sections 6.1 and 6.2 detail how the RI NPA BCA Model adheres to and supports the LCP Standards.

6.1 Cost Test

In accordance with Section 1.3.B of the revised Standards, the Company adheres to the Rhode Island Benefit-Cost Test (RI Test) for all SRP investment proposals. The Company has developed the RI NPA BCA Model, which is a derivative of the RI Test and utilizes the same Rhode Island Docket 4600 Benefit-Cost Framework (Framework), to more accurately assess NPA opportunities benefits and costs. Please see Appendix 5 for the RI NPA BCA Model.

The shift to using the RI NPA BCA Model has been a positive development for SRP. Per the LCP Standards, this specialized derivative of the RI Test is created using the RI Framework and accounts for applicable policy goals, PUC orders, regulations, guidelines, and other policy directives; accounts for all relevant, important aspects of the SRP and NPA programs; is symmetrical by including both costs and benefits for each relevant type of impact; is forward-looking by capturing the benefit-cost analysis over the life of the investment; and is transparent in its application and calculation.

Accounting for all costs and benefits associated with System Reliability Procurement provides a more robust accounting of the societal benefits that SRP investments deliver to electric customers, the state, and society.

The cost test and cost-effectiveness analyses of SRP investments use avoided cost impact factors developed by Synapse Energy Economics as part of the "Avoided Energy Supply Components in New England: 2021 Report" (2021 AESC Study), sponsored by New England's electric and gas energy efficiency program administrators.[9] The study utilizes state level avoided costs to reflect current and expected market conditions and are highly influenced by the cost of fossil fuels. Where applicable, the company utilizes site-specific calculations to augment the state level data. The cost-effectiveness analyses also include estimates of economic benefits applicable to System Reliability Procurement.

[9] "Avoided Energy Supply Components in New England: 2021 Report." *AESC 2021 Materials*, Synapse Energy Economics, Inc., 2021, https://www.synapse-energy.com/project/aesc-2021-materials.

Project-specific supply and distribution capacity values are also included. The company calculates a deferral value that utilizes the location-specific pipes solution expected cost, related operations and maintenance (O&M) costs, depreciation, and revenue requirements over the course of the expected lifetime of a pipes solution. A distribution deferral value is obtained by delaying the need date for a pipes solution or avoiding the pipes solution altogether.

The RI NPA BCA model will be continually reviewed by internal cross-functional teams and, in alignment with the SRP Year-End Report filings, externally on an annual basis by the EERMC Consultant Team (EERMC C-Team), Division, and the PUC.

The Company will use the RI NPA BCA Model, as detailed in Section 6 and Appendix 5, for assessing Rhode Island NPAs. Correspondingly, the RI NPA BCA Model Technical Reference Manual (RI NWA BCA Model TRM) is detailed in Appendix 6.

6.2 Cost-Effective

Cost-effectiveness is assessed at the program/project level in SRP. A cost-effectiveness analysis will be completed for potential NPA solutions. The SRP investment will be considered cost-effective if the benefit-cost ratio (BCR) for the resource is greater than 1.0. Utilizing the cost test as detailed in Section 6.1, NPA options will be compared to each other and the pipes option. This comparison will be utilized during the NPA evaluation process outlined in Section 8.4. Table 4 The Company plans to demonstrate cost-effectiveness for any specific projects by inclusion of the RI NPA BCA Model results in each SRP Investment Proposal filing. The benefit-cost analysis (BCA) methodology for SRP proposals is consistent with the language in the LCP Standards Section 1.3.C and Docket 4600 Framework.

Table 4 below summarizes the applicability of RI Test benefit and cost categories across the whole SRP program, including all categories applicable to the NPA and/or NWA programs. For specific applicability to the RI NPA BCA Model, please see Appendix 6 of this Report. For specific applicability to the RI NWA BCA Model, please see Appendix 5 of the 2020 SRP Year-End Report.

Table 4. Summary of RI Test Benefits and Costs Applicability

RI Test Category	Docket 4600 Category	SRP Program	Notes
Electric Energy Benefits	Energy Supply & Transmission Operating Value of Energy Provided or Saved (Power System Level)	X	(1)
	Retail Supplier Risk Premium (Power System Level)	X	
	Criteria Air Pollutant and Other	X	
	Distribution System Performance (Power System Level)	X	

RI Test Category	Docket 4600 Category	SRP Program	Notes
Renewable Portfolio Standards (RPS) and Clean Energy Policies Compliance Benefits	Renewable Energy Credits (REC) Value (Power System Level)	X	(1)
	Greenhouse Gas (GHG) Compliance Costs (Power System Level)	X	
	Environmental Externality Costs (Power System Level)	X	
Demand Reduction Induced Price Effects (DRIPE)	Energy DRIPE (Power System Level)	X	
Electric Generation Capacity Benefits	Forward Commitment Capacity Value (Power System Level)	X	(1)
Electric Transmission Capacity Benefits	Electric Transmission Capacity Value (Power System Level)	X	(1)
	Electric Transmission Infrastructure Costs for Site-Specific Resources	X	
Electric Distribution Capacity Benefits	Distribution Capacity Costs (Power System Level)	X	(1)
Natural Gas Benefits	Participant non-energy benefits: oil, gas, water, wastewater (Customer Level)	X	
Delivered Fuel Benefits		X	
Water and Sewer Benefits		O	(2)
Value of Improved Reliability	Distribution System and Customer Reliability/Resilience Impacts (Power System Level)	X	
Non-Energy Impacts	Distribution Delivery Costs (Power System Level)	O	(3)
	Distribution system safety loss/gain (Power System Level)	O	
	Customer empowerment and choice (Customer Level)	O	
	Utility low income (Power System Level)	O	
	Non-participant rate and bill impacts (Customer Level)	X	
Non-Embedded GHG Reduction Benefits	GHG Externality Cost (Societal Level)	X	
Non-Embedded Nitrogen Oxides (NOx) Reduction Benefits	Criteria Air Pollutant and Other Environmental Externality Costs (Societal Level)	X	
Non-Embedded Sulfur Dioxide (SO_2) Reduction Benefits	Public Health (Societal Level)	X	
Economic Development Benefits	Non-energy benefits: Economic Development (Societal Level)	O	(4)

RI Test Category	Docket 4600 Category	SRP Program	Notes
Utility Costs	Utility / Third Party Developer Renewable Energy, Efficiency, or Distributed Energy Resource (DER) costs	X	
Participant Costs	Program participant / prosumer benefits / costs (Customer Level)	X	

Notes
An "X" indicates that the category is quantified while an "O" indicates the category is unquantified, as applicable for RI NPAs in the SRP program.
(1) Electric-specific benefits/cost categories are captured in the RI NWA BCA Model and are not applicable to the RI NPA BCA Model.
(2) These non-electric utility benefits are expected to be negligible for a site-specific targeted need (i.e., NWAs or NPAs).
(3) Currently do not have data to estimate impacts for a targeted need case.
(4) Sensitivity analysis is currently under development. This benefit is negligible unless sensitivity analysis determines otherwise.

The following additional Docket 4600 Benefit Categories require further analysis to determine the appropriate methodology and magnitude of quantitative or qualitative impacts.

- Low-income participant benefits (Customer Level)
- Forward commitment avoided ancillary services value (Power System Level)
- Net Risk Benefits to Utility System Operations from DER Flexibility & Diversity (Power System Level)
- Option value of individual resources (Power System Level)
- Investment under uncertainty: real options value (Power System Level)
- Innovation and learning by doing (Power System Level)
- Conservation and community benefits (Societal Level)
- Innovation and knowledge spillover - related to demo projects and other Research, Design, and Development (RD&D) (Societal Level)
- Societal low-income impacts (Societal Level)
- National security and US international influence (Societal Level)

7. NWAs in System Planning

This section details the NWA Screening Criteria and the summary of the annual screening results analysis for the Company's Non-Wires Alternative program in Rhode Island.

7.1 Screening Criteria for NWA

The screening criteria for potential NWA opportunities are as follows:

Table 5: Screening Criteria for NWA Opportunities

Criteria Type	Criteria Requirement
Project Type Suitability	Project types include Load Relief and Reliability.[10] The need is not based on Asset Condition. Other types have minimal suitability and will be reviewed as suitability changes due to State or Federal policy or technological changes.
Timeline Suitability	Start date of solution implementation is at least 24 months in the future.
Cost Suitability	Cost of wires option is greater than $1M.
Load Level Suitability	If load reduction is necessary, then it will be less than 20% of the total load in the area of the defined need.

Additionally, by the Company's discretion, National Grid may pursue a project that does not pass one or more of these criteria if there is reason to believe that a viable NWA solution exists, assuming the benefits of doing so justify the costs.

No changes have been made to the NWA Screening Criteria since the prior proposals in the 2020 SRP Year-End Report.

These screening criteria are applied by the electric distribution planning team to all electric system needs that arise through planning analysis and system assessment. Such screening criteria are utilized during initial system assessment.

7.2 Analysis of System Needs

Detail on system needs that met the screening criteria and that the Company has determined may produce a potentially viable NWA opportunity are summarized in the table in Appendix 3 and detailed in the sections below as follows:

[10] For definition of reliability, see "Docket 3628: Proposed Service Quality Plan." *State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers*, Rhode Island Public Utilities Commission, 2004, www.ripuc.ri.gov/eventsactions/docket/3628page.html.

7.2.1 Bonnet 42F1

The Bonnet 42F1 NWA opportunity, formerly called Narragansett 42F1 NWA, intends to provide load relief in the Town of Narragansett by deferring or removing the need for feeder line work and reconfiguration on the Bonnet 42F1 feeder. The Bonnet 42F1 system need was identified as part of the South County East Area Study.

The Town of Narragansett is mostly supplied by (4) 12.47 kV distribution feeders. Feeder 42F1 is projected to be loaded above summer normal ratings and lacks useful feeder ties to reduce loading below their ratings. Either more capacity must be added or load must be reduced in the town. The distribution system need can be addressed through SRP by implementation of an NWA solution that provides load reduction capability.

The Company expects that the Bonnet 42F1 NWA timeframe will span twelve years from 2023 to 2034, which is the maximum amount of time based on the current peak load forecast that the substation and feeder upgrade can be deferred with this solution. There is the potential for a partial or continued NWA solution following 2034 with the Bonnet 42F1 NWA; however, this option has not been assessed at this time.

The Company issued an RFP for the Bonnet 42F1 NWA opportunity on December 29, 2020 and received third-party bid proposals on April 6, 2021. The Company received two bid proposals. Through extensive evaluation, the Company determined that the submitted bids did not pass the NWA evaluation criteria.

One of the bids was not financially viable, it did not prove cost-effective per the RI NWA BCA Model. The other bid was, while slightly cost-effective, entailed a carbon-heavy technology as part of its solution. Ultimately, neither bid was lower than the cost of the wires option and therefore did not comply with LCP Standard 1.3.H.

The Company will proceed with the wires option for the Bonnet 42F1 system need. Currently, the wires solution for this system need is not in any near-term ISR plan, due to the fact that the Company was in the process of completing its evaluation of the NWA proposals. Now that the process is complete, the Company plans on opening funding projects for these wires solutions and working the projects into a future ISR budget plan year.

7.2.2 South Kingstown

The South Kingstown NWA opportunity intends to provide load relief in the Town of South Kingstown by deferring or removing the need for feeder line work and reconfiguration on the Peacedale 59F3 and Kenyon 68F2 feeders. The South Kingstown system need was identified as part of the South County East Area Study.

The western section of the Town of South Kingstown is supplied mostly by (3) 12.47 kV distribution feeders. Feeders 59F3 and 68F2 are projected to be loaded above summer normal

ratings and lack useful feeder ties to reduce loading below their ratings. Either new feeder ties must be constructed or load must be reduced in the western half of the town. The distribution system need can be addressed through SRP by implementation of an NWA solution that provides load reduction capability.

The Company expects that the South Kingstown NWA timeframe will span thirteen years from 2022 to 2034, which is the maximum amount of time based on the current peak load forecast that the substation and feeder upgrade can be deferred with this solution. There is the potential for a partial or continued NWA solution following 2034 with the South Kingstown NWA; however, this option has not been assessed at this time.

The Company issued an RFP for the South Kingstown NWA opportunity on November 23, 2020 and received third-party bid proposals on February 22, 2021. The Company received three bid proposals. Through extensive evaluation, the Company determined that the submitted bids did not pass the NWA evaluation criteria.

One of the bids did not address the system need and did not provide a technically viable solution; it was non-responsive to the RFP. One of the bids was not financially viable, it did not prove cost-effective per the RI NWA BCA Model. The other bid was, while slightly cost-effective, entailed a carbon-heavy technology as part of its solution. Ultimately, none of the bids were lower than the cost of the wires option and therefore did not comply with LCP Standard 1.3.H.

The Company will proceed with the wires option for the South Kingstown system need. Currently, the wires solution for this system need is not in any near-term ISR plan, due to the fact that the Company was in the process of completing its evaluation of the NWA proposals. Now that the process is complete, the Company plans on opening funding projects for these wires solutions and working the projects into a future ISR budget plan year.

8. NPAs in System Planning

This section details the Company's Non-Pipeline Alternatives program in Rhode Island.

The Company proposed to develop the NPA program, process, and its integration with gas system planning over calendar years 2021 through 2023 in its 2021-2023 SRP Three-Year Plan. Status and progress updates on NPA program development are provided as detailed below.

Particularly with respect to progress to date from 2020, and Q1 2021, the Company has refined the NPA screening criteria and the NPA evaluation process. Additionally, the Company has outlined the NPA planning process and integration with gas system planning and developed an RI NPA BCA Model and framework.

8.1 Program Development Approach

In developing the NPA Program, the Company is leveraging the NWA Program as a baseline. The NWA Program has been developed and improved upon over the past thirteen years. The Company strives for continuous improvement through internal and external feedback and has created and has maintained supporting documentation to streamline program development.

Prior to development of the NPA Program, knowledge-sharing discussions were held with the NWA team. These conversations will continue throughout the development of the NPA Program.

The Company recognizes that while there is opportunity for transferrable components of the program, there are fundamental differences between the gas and electric business units that would prompt divergent, unique, and tailored approaches. At this stage, internal working groups have been established to assess what changes would be needed to reflect and align with gas business requirements and standards. Within these discussions, peer utility reviews have been conducted to incorporate best practices from proposed NPA Programs.

This close internal coordination between the NWA and NPA teams and the external stakeholder input through the SRP TWG has been critical to delivering NPA Screening Criteria and an NPA Evaluation Process that are likely to result in robust and fair consideration of NPAs.

8.2 Screening Criteria for NPA

The Company proposes the following screening criteria for NPAs.

Table 6: Screening Criteria for NPA Opportunities

Criteria Type	Criteria Requirement
Timeline Suitability	Start date of solution implementation is at least 24 months in the future.
Cost Suitability	Cost of pipes option is greater than $0.5M.

Reliability of the Gas System	The pipes investment has negligible or no effect on critical reliability of the local or broader gas system. This effect on critical reliability will be determined through gas system modeling and will be determined based on engineering judgement.

Additionally, by the Company's discretion, National Grid may propose to pursue a project that does not pass one or more of these criteria if there is reason to believe that a viable NPA opportunity exists, assuming the benefits of doing so justify the costs.

The projects that meet the screening criteria will be prioritized in consideration of capacity-constrained locations. Capacity-constrained refers to areas of the gas network where the system is challenged to access natural gas when and where it is needed in sufficient quantities to meet customers' peak demand, as described in the Aquidneck Island Long-Term Gas Capacity Study.[11] These capacity-constrained areas serve to greater benefit from the implementation of an NPA in their potential to reduce usage or increase supply during timeframes of peak demand. The Company will prioritize NPA-eligible proposed projects that are in or affect these regions or sections of the gas network.

Timeline suitability considers the timeframe between when a proposed pipes investment is identified and the required in-service date.

Cost suitability is determined by the estimated cost of the proposed pipes investment. The Company set the initial floor price at $0.5M based on the consideration that any system need with a pipes option value less than $0.5M would not produce an economically viable NPA opportunity and that the market does not find such NPA opportunities to be fiscally prudent for their goals and policies. The Company will annually evaluate whether the initial floor price is appropriate based on market feedback and propose any modification through the SRP Program Year-End Reports.

Reliability of the gas system reflects the importance of continued safe and reliable operation. System modeling is utilized to assess immediate, local, and system-wide reliability impacts to the gas network and will be leveraged to identify the proposed pipes investments that have negligible to no effect on the critical reliability. National Grid utilizes Synergi Gas® modeling software to perform various analyses necessary for distribution system operations (e.g., regulator pressure settings, LNG requirements) and capital planning. As a part of the gas planning process, National Grid identifies asset investments that ensure continued safe and reliable operation of the gas system in meeting forecasted customer requirements. For asset replacement investments, the project scope is reviewed in the system model to assess immediate, local, and system-wide reliability impacts to the gas network. If the system model determines there is a negative impact (e.g., peak

[11] *Aquidneck Island Long-Term Gas Capacity Study*, The Narragansett Electric Company d/b/a National Grid, Sept. 2020, www.nationalgridus.com/media/pdfs/other/aquidneckislandlong-termgascapacitystudy.pdf.

system pressures decrease close to or near system minimum pressures or creates a system constraint) to system reliability locally or system-wide, scope changes will be recommended. The scope changes may include identifying a portion of the original proposed pipe scope of work that must be completed to alleviate the negative impact to system reliability, which may allow the NPA opportunity to go forward.

These screening criteria are applied by the Gas Asset Management and Engineering (GAME) team to gas system needs that arise through planning analysis and system assessment. Such screening criteria is utilized during initial system assessment.

The Company has updated its NPA screening criteria to incorporate lessons learned from NWA and feedback from stakeholders. Two revisions made to the NPA Screening Criteria include: removal of the separation between Small and/or Large Projects and expansion on the Reliability of the Gas System criteria. The Company feels this will simplify the criteria for the market while allowing the maximum number of projects to be eligible for NPA consideration.

The Company requests approval of the proposed revisions to the NPA Screening Criteria for Rhode Island as detailed in Section 8.2 for calendar years 2021 through 2023.

8.3 NPA Planning Process and Integration with Gas System Planning

This section illustrates the NPA planning process for distribution system planning.

Potential NPA opportunity screening and analysis are included as a standard part of the gas distribution system planning process.

This planning and integration process is very similar to the process followed by the NWA program. The key difference is that Initial System Assessment and Engineering Analysis are combined as one step in the NPA program, whereas these are two separate steps in the NWA program. This combination is driven by prioritization of capacity-constrained target areas as an output of the gas distribution system planning process. This output enables an engineering analysis within the same step to continue to refine an understanding of the system need.

The Company identifies and screens potential NPA opportunities through the following high-level sequential process once a system need is identified or an area study is initiated:

1. Scoping

The GAME team develops a scope for a specific system need or a scope that details the boundaries and concerns of an area or section of the distribution system. Planning criteria, Company standards, and forecasts are inputs to the Scoping stage.

A system study is an analysis for a specific section of the distribution system that assesses the gas system constraint characteristics and the health of infrastructure.

2. Initial System Assessment & Engineering Analysis

The GAME team performs an initial system assessment, either as part of a system study or when other targeted asset management and planning projects are initiated, such as for a specific system need.

The initial system assessment consists of a detailed analysis of a facilities and system performance within the identified study's geographic and gas scope. Initial system assessments are the first step to gather information for area studies and other system evaluations.
An engineering analysis is performed to gather detailed information for comprehensive plan development to solve the system need. This information is also included as part of development of an NPA opportunity and an NPA RFP as required.

Additionally, the potential for targeted EE and targeted DR sourced from internal Company programs is assessed at this stage, if timing for the system need allows, to determine whether they are viable components to include as part of an NPA solution. Formal evaluation of the internally-sourced targeted EE or targeted DR proposals is handled at the same time external bid proposals are evaluated.

System needs that are sufficiently out in the future are re-analyzed to determine whether the technical and economic requirements have changed in a way that allows an NPA option to be potentially feasible, per the NPA screening criteria. Timing of re-evaluation is established within and determined by the specific system study.

3. Plan Development

Plan development is the stage when pipes options and non-pipes options are developed.

To determine whether a potential NPA opportunity is feasible for a gas system need, the GAME team screens distribution projects with the criteria listed in Section 8.2, which are aligned with the Company's internal planning document. Feasibility is based on these screening criteria, which cover technical, economic, and timing factors.

These NPA screening criteria are applied to an identified gas system need and resulting potential NPA opportunities are investigated.

The NPA team develops the NPA RFP, sends the RFP to market, and receives and evaluates NPA bid responses during this stage. National Grid maintains a technology-agnostic approach to ensure that the active NPA market can propose a broad range of technologies would be considered with

NPA RFPs. Currently an NPA RFP could seek natural gas load reduction or load removal. For a load reduction NPA RFP, NPA technologies such as EE, weatherization, DR, partial electrification, and full electrification would be considered. For a load removal NPA RFP, only NPA technologies that eliminate the use of natural gas would be considered, meaning full electrification exclusively. This requirement would be outlined as a part of the NPA RFP to ensure the NPA RFP responses deliver the needed natural gas demand reduction and/or removal to defer or avoid the pipes investment. Please see Section 10.1 of the 2021-2023 SRP Three-Year Plan for the market engagement channels the Company utilizes for NPA outreach.

The NPA team analyzes and evaluates the NPA options in parallel to the pipe option, which is developed by the GAME team.

4. Select Recommended Plan

The GAME and NPA teams then collaboratively review and compare the pipes and non-pipes options with respect to project cost and the cost-effectiveness of the options, system reliability, safety, and other factors and finalize the recommended plan. Please refer to Section 6 for explanation on cost-effectiveness and BCA breakdown.

If an NPA option is selected as the solution for the gas system need, then the NPA solution is proposed through the next SRP Investment Proposal, as detailed in Section 12 of the 2021-2023 SRP Three-Year Plan.

If a pipes solution is the best option, and if actual load growth continues at a rate where the pipe investment is still needed, then that pipe investment is fully developed and incorporated into a future Gas Infrastructure, Safety and Reliability Plan (Gas ISR Plan). Gas ISR Plans are filed annually.

If the NPA option is determined to be more cost-effective than the pipe option but is nonetheless not selected, the Company will then provide a detailed explanation for the selection of the pipe option.

Once a pipe solution is selected for a distribution project and is proposed in an annual Gas ISR Plan filing, it is not screened for NPA feasibility again.

For reference on timing of the NPA review process and possible inclusion in a specific year's Gas ISR Plan please see Figure 1 and Figure 2, which illustrate the Distribution Planning Study Process and NPA Procurement Process, respectively. The Distribution Planning Study Process outlines the major steps and study-based inputs in the overall area study process.

Please note that capital infrastructure projects that have passed screening for potential NPA opportunities will not be advanced in the Gas ISR Plan unless they have been fully evaluated for

NPA. Also note that the Company reevaluates the potential for an NPA opportunity for a system need only if the technical and economic requirements of the system need and corresponding pipe option have changed significantly and if the timeframe allows according to the screening criteria. These reevaluation limits are set to prevent causing market and bidder exhaustion by persistently cycling through the same potential NPA opportunities that are ultimately deemed unviable by the market.

Please note that projects that have had the potential for NPA screened out, including any follow-up re-evaluation or re-screening of the system need, are progressed through the pipe option pathway. These pipe options are not proposed in a Gas ISR Plan for implementation until the pipe option is fully developed.

A general example of this process from the perspective of NPA options analysis is as follows:

1. GAME identifies a system need.
2. GAME screens the system need through the NPA screening criteria detailed in Table 6.
    a. If the system need fails any of the NPA screening criteria, then the Company pursues the pipe option.
    b. If the system need passes the NPA screening criteria, then the Company proceeds with NPA options analysis.
3. The NPA project manager (PM) gathers engineering data and the system need technical requirements from GAME.
4. The NPA PM assesses the potential for internally-sourced targeted EE and targeted DR from National Grid's EE and DR Programs. The NPA PM requests an internal targeted EE/DR option from the Customer Energy Management (CEM) team.
5. The NPA PM develops the RFP for the NPA opportunity.
6. The Procurement team sends the NPA RFP out to market and engages the market through the channels detailed in Section 10.1 of the 2021-2023 SRP Three-Year Plan.
7. Third-party bid proposals are received. The NPA opportunity is now in proposal review, as illustrated by Figure 2.
8. The review team comprised of subject matter experts (SMEs) and internal stakeholders evaluates all bid proposals received with the NPA evaluation criteria detailed in Table 8, including the internal targeted EE/DR option from the CEM team.
    a. If no bid proposals pass NPA evaluation, and are therefore deemed not viable, the Company pursues the pipe option.
    b. If at least one bid proposal passes NPA evaluation, then the Company continues with NPA proposal evaluation.
9. Additional step, Rhode Island only: the NPA PM and GAME lead compare the costs of the prime NPA option to the prime pipe option, which was developed and assessed by GAME in parallel to the NPA option developed and evaluated by the NPA team. This assessment is in line with LCP Standard 1.3.H, as referenced in Section 3.6 of the 2021-2023 SRP Three-Year Plan.

a. If the NPA option is determined to be least-cost compared to the pipe option, then the NPA option is selected given that it already passed all NPA evaluation criteria.
b. If the NPA option is determined to not be least-cost compared to the pipe option, then the pipe option is selected.

10. If the technical and economic requirements of the system need and corresponding pipe option change significantly following initial NPA options analysis and the timeframe allows according to the screening criteria, then the GAME team notifies the NPA team and the NPA PM begins a new NPA options analysis.
11. If the NPA option passed all NPA evaluation criteria and the LCP 1.3.H requirement, then the Company awards the NPA project to the winning bid and proceeds with contract negotiation with the respective bidder.
12. Following contract negotiation, the Company proposes the NPA project in an SRP Investment Proposal filing.
13. If the NPA project proposal is approved by the PUC, then the Company coordinates with the bidder to start NPA project implementation.

The Company plans to continue analyzing its current NPA screening and development processes to determine how NPAs might be best considered as both complete and partial solutions.

Figure 1: Gas Distribution Planning Study Process Flowchart

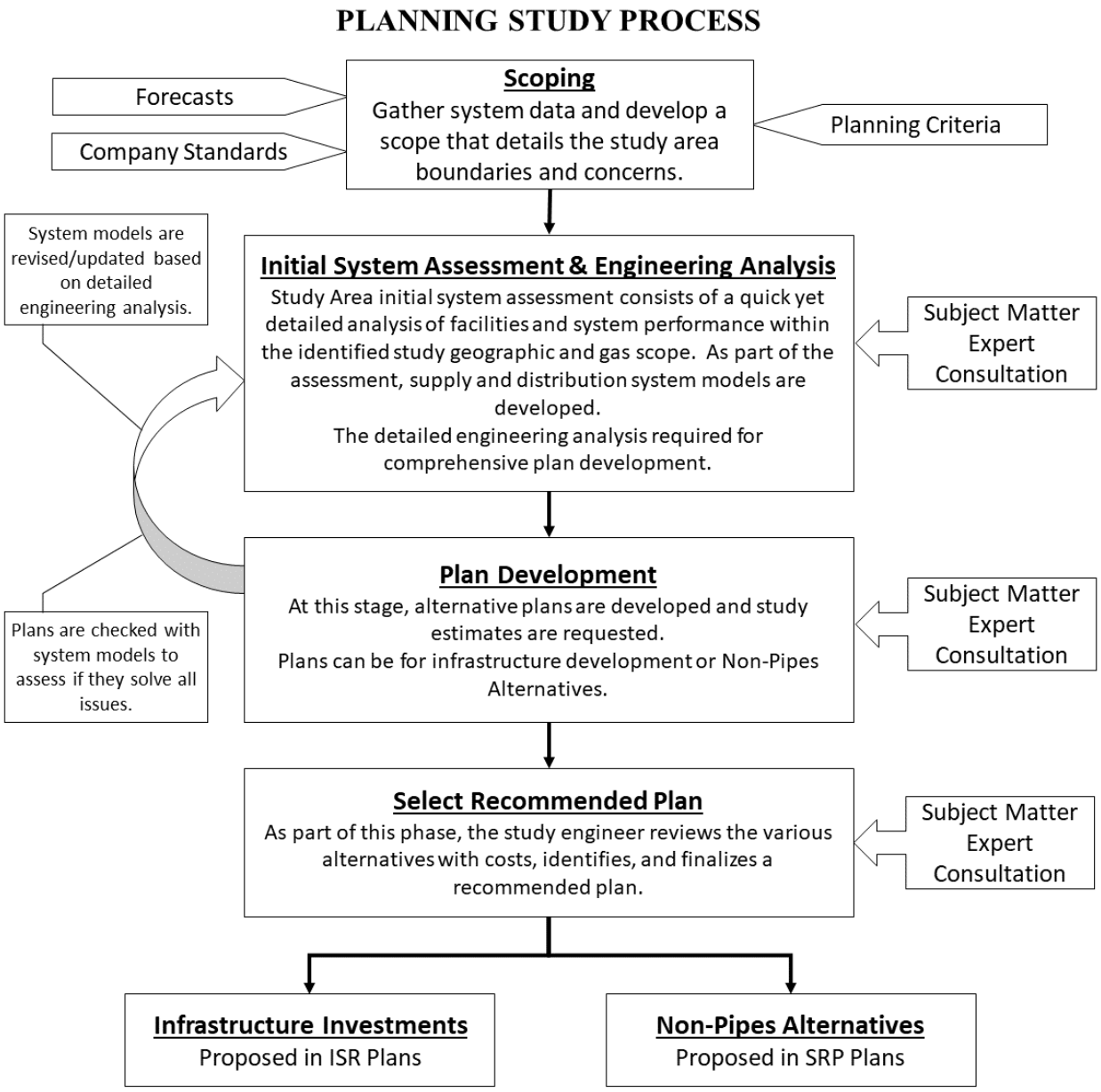
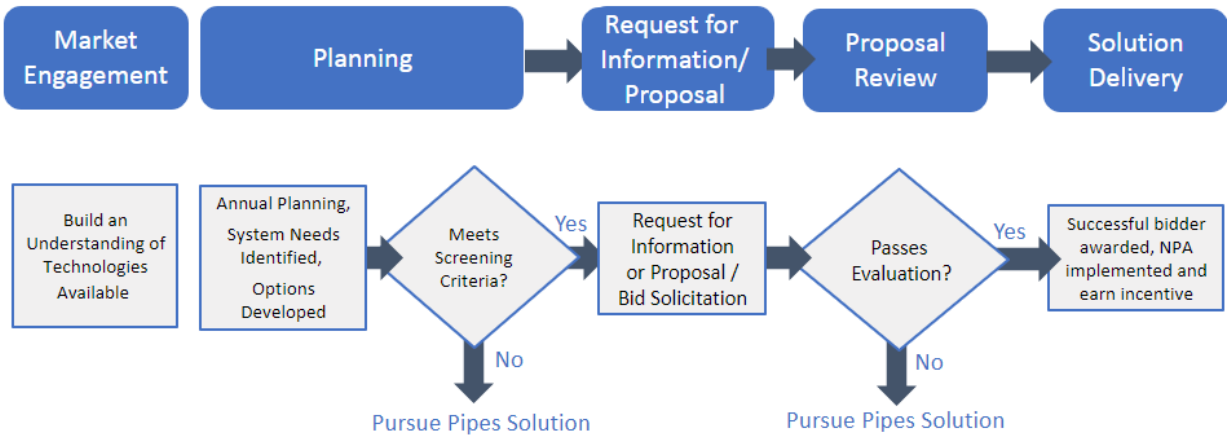


Figure 2: Overview of National Grid's NPA Procurement Process



8.4 Evaluation Process for NPA

Following receipt of all bid proposals from an NPA opportunity, National Grid proceeds directly into the evaluation stage of the NPA process. This evaluation and review of submitted bid proposals is comprised of four rounds of evaluation, with each round based on a high-level screening, detailed technical review, detailed economic review, customer acceptance, and final round selections, as detailed in the table and figure below. All bid proposals are evaluated in parallel through these four rounds.

This evaluation process is nearly identical to the process followed by the NWA program but has one difference. Namely, the NPA program considers and includes customer acceptance in Round 2.

Figure 3: National Grid NPA Evaluation Rounds

Table 7: National Grid NPA Evaluation Rounds Descriptions

Round	Evaluation Focus
Round 1	Go/No-Go: Preliminary BCA, bidder qualifications, technology type and maturity, schedule, engineering
Round 2	Detailed Technical Review: engineering, controls, communications and operations, customer acceptance, permitting, schedule and milestones
Round 3	Detailed Economic Review: full BCA, credit rating assessment, financing structure, payment structure, additional included costs and incentives
Round 4	Final Review of Shortlisted Bidders, winning bidder selection as applicable, contract negotiation

The "preliminary BCA", as indicated in Round 1 in the table above, is to determine if the cost-effectiveness of the proposal is feasible. It involves the initial proposed solution cost and applicable benefits based on technology. The "full BCA", as indicated in Round 3 in the table above, include the more complex factors, such as interconnection cost and any contract negotiation changes, and other factors that require deeper research to determine.

Customer Acceptance will play a critical role in the success of implementing an NPA. Within the 2020 SRP Year-End Report, the Company proposed customer acceptance determination as a separate round. As we have continued to develop the program and incorporating feedback from stakeholders, the Company will consider the likelihood of adoption of an NPA solution within the Detailed Technical Review in Round 2 and plans to review what is proposed by the vendor with input from internal subject matter experts.

Leveraging the knowledge and lessons learned gained through the Company's NWA Program and NWA evaluation process, the Company has referenced the NWA evaluation categories in order to develop the NPA evaluation process. These evaluation categories will be applied to every NPA bid proposal for any solution approach or technology type that National Grid receives. This includes proposals sourced from third-party solution providers or from an internal National Grid team.

Partial NPA opportunities are also assessed as an option. Partial NPAs are solutions that address part of a specified system need with the rest of the system need addressed by a pipes option. A partial NPA effectively reduces the scope of infrastructure projects.

The factors that will be considered within NPA evaluation include reliability, functionality, existing market conditions for the proposed technologies, societal and environmental impact, cost-effectiveness, safety and risk, flexibility, ability to meet the specific system need, bidder's experience, and the ability for a solution proposal to pass the BCA. The NPA bid proposal that

scores highest in total across all categories and meets the minimum criteria requirements (cost-effective, meets the technical need, and does not detrimentally impact the customer) is selected as the winning bid, as applicable. Additionally, in Rhode Island, the cost and cost-effectiveness are compared between the NPA option and the pipes option, in alignment with LCP 1.3.H. The NPA evaluation categories are detailed and described in Table 8 below.

Table 8: National Grid USA Evaluation Categories for NPA Proposals

Category	Description
Proposal Content & Presentation	Information requested has been provided by the bidder and is sufficiently comprehensive and well presented to allow for evaluation.
Bidder's Experience	The experience of the Bidder, any Engineering, Procurement and Construction (EPC) contractor, prime subcontractors and, if applicable, O&M operator or other entity responsible for the development, construction, or operation of the proposed solution.
Environmental	The Bidder's Proposal shall address impacts including but not limited to acoustic, aesthetic, air and greenhouse gas (GHG) emissions, water, and soil impacts, and permitting and zoning considerations. This includes greenhouse gas abatement and considers a proposal's ability to produce an outcome that reduces the amount of greenhouse gas emissions that would otherwise be produced from the pipes option.
Project Viability	The likelihood that the solution(s) associated with a Proposal can be financed and completed as required by the relevant agreement.
Functionality	The extent to which the proposed solution would meet the defined functional requirements and the ability to provide demand reduction during peak times and within the geographic area of need.
Technical Reliability	The extent to which the proposed type of technology and the equipment would meet the reliability need and can be integrated with utility operations including the ability to monitor and dispatch as applicable.
Safety	National Grid requires that the Bidders recognize safety is of paramount importance. Bidders will be required to provide safety information related to the proposed technology and information regarding safety history. The bid should comply with any jurisdictional compliance and regulatory safety codes.
Customer and Socioeconomic Impacts	The Bidder's Proposal shall address how the proposed technology impacts the customer in addition to temporary and permanent jobs to be created, economic development impacts, and property tax payments. National Grid also assesses public health and energy pricing impacts of each solution proposal.
Scheduling	The Bidder's Proposal shall include proposed timelines outlining milestones and provide sufficient detail for each deliverable, including meeting the in-service need date.
Offer Price	The Bidder's Proposal shall be based on project-specific values and financing requirements.

Category	Description
Adherence to Terms	The extent to which the Bidder accepts National Grid's proposed terms will be taken into consideration. The RFP evaluation may impute an additional amount to Bidder's Proposal to reflect any proposed modifications to the non-price terms and conditions by the Bidder that result in National Grid incurring additional costs or risks. Redlines to the terms shall be provided by the Bidder as part of its proposal for review by National Grid during the evaluation period.
Credit	Bidder's capability and willingness to perform all of its financial and other obligations under the relevant agreement will be considered by National Grid in addition to Bidder's financial strength, as determined by National Grid, and any credit assurances acceptable to National Grid that Bidder may submit with its Proposal.
Customer Acceptance	The extent to which the bidder provides compelling evidence for achieving sufficient customer adoption to achieve needed customer adoptions. This may include data, market research, outreach plans on how to promote customer adoptions.
Cost-Effectiveness	This analysis will be performed to determine the cost-effectiveness of a proposal and the RI NPA BCA Model will be used.

9. Rhode Island System Data Portal

This section details the Rhode Island System Data Portal and associated resources.

The Portal is an interactive online mapping tool developed by the Company. The Portal provides specific information for select electric distribution feeders and associated substations within the Company's electric service area in Rhode Island. This information includes feeder characteristics such as geographic locations, voltage, feeder ID, planning area, substation source, approximate loading, and available distribution generation hosting capacity.

The Portal provides this information to stakeholders, customers, and third-party solution providers. The main target audience is third-party solution providers and the main goal of the Portal is to provide information in order to engage the market for cost-effective grid solutions to reduce costs for Rhode Island customers. Therefore, the Portal is considered an SRP resource because it adheres to LCP standards and goals and is a complementary activity to meet electrical energy needs.

Costs related to Portal maintenance and routine operation of existing Portal aspects and work by FTEs are included in the current rate case. Only new enhancements to the Portal are covered in SRP Investment Proposals. New enhancements are expected to originate from collaborative consultation between National Grid and external stakeholders.

A public landing page for the Portal is located on the customer-facing National Grid website.[12]

9.1 Updates to the Portal in the Past Year

The Company has added the following new enhancements to the Portal in CY 2021:

- Application of nodal analysis to the Hosting Capacity map
- Addition of preset filters to the Heat Map to more easily allow for display of feeders based on % loading level
- Uploaded the 2021 and 2022 Electric Peak (MW) Forecast Reports to the "Company Reports" tab
- Uploaded all Electric ISR filings to date to the "Company Reports" tab

These updates were incremental and at no additional cost.

9.2 Portal to Date

[12] See Rhode Island System Data Portal. *National Grid US*, National Grid USA Service Company, Inc., 2018, www.nationalgridus.com/Business-Partners/RI-System-Portal.

To date, the Portal includes tabs that detail select Company reports, a distribution assets overview map, a heat map, a hosting capacity map, sea level rise, and National Grid's NWA program. Each map tab has the date listed in its about dropdown for when the tab data was last updated.

The Company Reports tab lists documents such as the annual SRP reports, annual ISR proposals, the electric peak forecast, and redacted area study reports.

The FAQ tab lists common questions with standard responses to proactively inform and resolve confusion for visitors to the Portal, such as third-party solution providers.

The Distribution Assets Overview tab contains a map that displays specific electric distribution feeder and substation information, summer normal ratings, and up-to-date recorded loading and forecasted loading.

The Heat Map tab contains an interactive color-coded map of distribution feeders based on forecasted load compared to summer normal rating. The heat map provides information on circuits that would benefit from DER interconnection for load relief, and on circuits that have existing capacity for electric vehicle (EV) charging stations, heat pumps, and other beneficial electrification opportunities.

The Hosting Capacity tab contains an interactive map of distribution feeders based on interconnected DG. The hosting capacity map also contains information on substation ground fault overvoltage (3V0) protection status. The Portal details if 3V0 is installed at a substation or if 3V0 is in construction or slated for construction and the proposed in-service date. Installation of 3V0 makes a substation transformer "DG-ready". The Hosting Capacity map now demonstrates nodal analysis to show variation in hosting capacity along the length of each feeder.

The Sea Level Rise tab is an interactive map that overlays National Oceanic and Atmospheric Administration (NOAA) federal sea level rise map data with National Grid's electric distribution network map data in Rhode Island. This map provides information intended to help third-party solution providers and DER developers identify locations on the National Grid electric distribution network in relation to areas that may experience potential coastal flooding impacts in the future. All sea level rise data is sourced and mirrored from the NOAA Sea Level Rise Viewer.[13]

The NWA tab contains a link to National Grid's NWA Website[14], which hosts information on the Company's NWA process and NWA RFP opportunities.

[13] "NOAA Sea Level Rise Viewer." *NOAA Sea Level Rise and Coastal Flooding Impacts*, National Oceanic and Atmospheric Administration of the United States Department of Commerce, https://coast.noaa.gov/slr/.

[14] "Non-Wires Alternatives." *National Grid Business Partners*, National Grid USA, Inc., 13 Nov. 2019, www.nationalgridus.com/Business-Partners/Non-Wires-Alternatives/.

10. SRP Market Engagement

This section provides information regarding the Company's market engagement efforts with respect to SRP.

SRP Market Engagement aims to raise awareness and perform outreach and engagement for the Rhode Island System Data Portal as needed, for NWA-related activities not covered by FTE work, and with third-party solution providers.

Outreach and engagement for activities specific to NPA and NWA, such as NPA or NWA RFPs, are already included in the work by FTEs dedicated to the development and pursuit of NWA opportunities and solutions. These FTEs are covered by the rate case.

SRP market engagement will enable third-party solution providers and vendors to more easily access available information about National Grid's electric distribution system and SRP opportunities in Rhode Island and therefore further enable these solution providers to create, submit and develop innovative energy solutions for Rhode Island customers. SRP Market Engagement upholds the commitment of National Grid and the State of Rhode Island to advance a more reliable, safe, and cost-effective energy landscape for residents and businesses of Rhode Island.

10.1 Market Engagement Activity of the Past Year

For calendar year 2021, the Company entered a maintenance phase with market engagement for the Rhode Island System Data Portal. Therefore, the only planned SRP Market Engagement activities for the Portal are to maintain web traffic analytics to the Portal landing page. These web traffic analytics have no cost to operate or acquire.

As stated in Section 4, slight budget spend did occur in the SRP Market Engagement category resulting from wrap-up in Q1 2021 of the RI Developer Portal Survey that occurred at the end of CY 2020. This survey is detailed in Section 9 and Appendix 7 of the 2020 SRP Year-End Report in Docket No. 5080.[15]

[15] Docket No. 5080." *State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers*, The Narragansett Electric Company d/b/a National Grid, 20 Nov. 2020, www.ripuc.ri.gov/eventsactions/docket/5080page.html.

Appendices

Appendix 1 – Rhode Island Company Electric Service Projected Load Growth

Forecasted Load Growth for NWA Opportunities

This appendix provides an overview and update on the Rhode Island electric service projected load growth rates as well as the forecasted load growth for locations in Rhode Island that have the potential for NWA opportunities.

The Company's electric distribution system serves close to 500,000 customers in 38 cities and towns in Rhode Island. The residential class accounts for approximately 41% of the Company's total Rhode Island load, the commercial class accounts for approximately 49%, and the industrial class accounts for approximately 10%.

The forecasted load growth data is derived from the 2022 Electric Peak (MW) Forecast Report[16], which is publicly available in the Company Reports tab on the Rhode Island System Data Portal.

The forecasted load growth rates for counties in Rhode Island are shown in the Rhode Island Projected Load Growth Rates table below. Additionally, as seen in the sections below for Bristol, Kent, and Providence counties, the average annual growth rates are projected to be flat or negative over the next 10 years.

The Company has not presently identified other NWA opportunities through the distribution system planning process.

The Company accounts for DR, EE, EV, and PV impacts in the Company's electric peak load forecasting.

Forecasted Load Growth in Bristol County

The Bristol County area annual weather-adjusted summer peak is expected to increase at an average annual growth rate of 0.4% for the next 10 years. This rate is less than the statewide average annual growth rate of 0.6%.

Forecasted Load Growth in Kent County

The Kent County area annual weather-adjusted summer peak is expected to increase at an average annual growth rate of 0.1% for the next 10 years. This rate is less than the statewide average annual growth rate of 0.6%.

Forecasted Load Growth in Newport County

The Newport County area annual weather-adjusted summer peak is expected to increase at an average annual growth rate of 0.9% for the next 10 years. This rate is greater than the statewide average annual growth rate of 0.6%.

[16] Gredder, Joseph F., and Jingrui (Rain) Xie. "2022 Electric Peak (MW) Forecast Report." *Rhode Island System Data Portal*, The Narragansett Electric Company d/b/a National Grid, 12 Nov. 2021, ngrid-ftp.s3.amazonaws.com/RISysDataPortal/Docs/RI_PEAK_2022_Report.pdf.

Forecasted Load Growth in Providence County

The Providence County area annual weather-adjusted summer peak is expected to increase at an average annual growth rate of 0.4% for the next 10 years. This rate is less than the statewide average annual growth rate of 0.6%.

Forecasted Load Growth in Washington County

The Washington County area annual weather-adjusted summer peak is expected to increase at an average annual growth rate of 1.1% for the next 10 years. This rate is greater than the statewide average annual growth rate of 0.6%.

Table A1-1: Rhode Island Projected Load Growth Rates

State	County	Town	Annual Growth Rates (%) 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	5-year Average (%) 2022 to 2026	10-year Average (%) 2022 to 2031
RI			0.9	0.7	0.4	0.6	-0.1	0.9	0.6	0.6	0.7	0.7	0.5	0.6
	BRISTOL		0.7	0.5	0.1	0.3	-0.3	0.8	0.4	0.5	0.6	0.6	0.3	0.4
	KENT		0.2	0.0	-0.2	0.0	-0.6	0.5	0.2	0.3	0.4	0.4	-0.1	0.1
	NEWPORT		1.4	1.2	0.8	0.9	0.3	1.2	0.9	0.9	1.0	0.9	0.9	0.9
	PROVIDENCE		0.6	0.4	0.1	0.3	-0.3	0.8	0.4	0.5	0.6	0.6	0.2	0.4
	WASHINGTON		1.8	1.5	1.0	1.2	0.5	1.4	1.0	1.0	1.1	1.0	1.2	1.1

Appendix 2 – Screened Wires Projects

Table A2-1: Screened Wires Projects

Count	Project ID	Project Description	NWA Comment	Partial NWA Comment	Capex Spending Rational	Date Initiated
1	C089195	RI Repl ACNW Vault Vent Blowers	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	11/8/2021
2	C088838	IRURD HIGH POINT & CIRCLE DR N.S.	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	9/16/2021
3	C087903	Langworthy 3V0 D-SUB	Does not meet NWA screening requirements - Programmatic Ground Fault Overvoltage Protection to address accumulated Distributed Energy Resource interconnections	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	5/5/2021
4	C088009	Weaver Hill Rd. SubT Extension	Does not meet NWA screening requirements - the current feeders in the area experience operation, reliability, and voltage performance issues, that an NWA would not be suitable to offset. Also, the amount of load would be required is greater than 20% of the total area load.	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	5/19/2021
5	C085414	Weaver Hill Rd Feeder DLine	Does not meet NWA screening requirements - the current feeders in the area experience operation, reliability, and voltage performance issues, that an NWA would not be suitable to offset. Also, the amount of load would be required is greater than 20% of the total area load.	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	3/30/2020
6	C085412	Weaver Hill Rd DSub	Does not meet NWA screening requirements - the current feeders in the area experience operation, reliability, and voltage performance issues, that an NWA would not be suitable to offset. Also, the amount of load would be required is greater than 20% of the total area load.	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	3/30/2020
7	C088058	New London 150F6 Reconductoring	Does not meet NWA screening requirements - <$1 Million in cost	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	5/27/2021
8	C088052	Division St. 61F2 Reconductoring	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/27/2021
9	C087771	Nasonville gateway work	Does not meet NWA screening requirements - <$1 Million in cost	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	4/16/2021

Count	Project ID	Project Description	NWA Comment	Partial NWA Comment	Capex Spending Rational	Date Initiated
10	C089226	Wethersfield Commons URD	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	11/16/2021
11	C088827	Valley and Farnum 23kV Conversion	Does not meet NWA screening requirements - Customer conversion project. 23kV supply to the area is being retired due to Asset Condition and reliability, therefore these customers have to be converted to 13.8kV	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	9/15/2021
12	C088062	2232 Industrial Dr. ERR	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/27/2021
13	C087862	Apponaug Long-Term Plan (D-Line)	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	4/28/2021
14	C087770	Nasonville 127 Substation Expansion	Does not meet NWA screening requirements - amount of load offset is greater than 20% of area loading.	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	4/16/2021
15	C090149	RI Repl UG Fault Ind Dyer St/Ea Geo	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	3/16/2022
16	C089349	Prudence Island Backup Gen Site	Does not meet NWA screening requirements - Timeline of need was immediate, <$1 Million in cost	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	12/3/2021
17	C088059	Kilvert 87F1 Line Extension	Does not meet NWA screening requirements - <$1 Million in cost	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	5/27/2021
18	C088055	Hopkins Hill 63F6 Feeder Tie	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/27/2021
19	C088048	Coventry 54F1 Reconductoring	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/27/2021
20	C088047	Hope #15 Equipment Replacement	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because	Asset Condition	5/27/2021

Count	Project ID	Project Description	NWA Comment	Partial NWA Comment	Capex Spending Rational	Date Initiated
				it is an Asset Condition Driven Program		
21	C089682	Valley 102W51 Summer Prep Work	Does not meet NWA screening requirements - Timeline of need was immediate, <$1 Million in cost	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	2/2/2022
22	C089060	2227 Line Str 13 Pole Replacement	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	10/18/2021
23	C088061	2232 Panto Rd. ERR	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/27/2021
24	C087783	Rebuild Centredale Substation	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	4/20/2021
25	C088735	IR URD FAIR OAKS LN URD RI- LINCOLN	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	9/1/2021
26	C088337	EG Heights URD Cable Replacement	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	7/7/2021
27	C088057	Natick 29F1 Reconductoring	Does not meet NWA screening requirements - Timeline of need was immediate, <$1 Million in cost	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	5/27/2021
28	C088046	Coventry #54 Sub Relocation	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/27/2021
29	C088007	Natick #29 Equipment Replacement	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/19/2021
30	C087912	3763 Pole Replacements	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because	Asset Condition	5/6/2021

Count	Project ID	Project Description	NWA Comment	Partial NWA Comment	Capex Spending Rational	Date Initiated
				it is an Asset Condition Driven Program		
31	C087861	Apponaug Long Term Plan (D-Sub)	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	4/28/2021
32	C088864	Clarkson St 3V0 D-SUB	Does not meet NWA screening requirements - Programmatic Ground Fault Overvoltage Protection to address accumulated Distributed Energy Resource interconnections	This project would not be suitable for consideration of a Partial NWA	System Capacity & Performance	9/20/2021
33	C088340	Paddock Estates URD Cable Replace	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	7/7/2021
34	C088006	Anthony #64 Equipment Replacement	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/19/2021
35	C088008	Warwick Mall #28 Equipment Replacem	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	5/19/2021
36	C087784	Centredale Getaways	Does not meet NWA screening requirements - Asset Condition Driven Project	This project would not be suitable for consideration of a Partial NWA because it is an Asset Condition Driven Program	Asset Condition	4/20/2021

Appendix 3 – NWA Opportunities Summary

Table A3-1: NWA Opportunities Summary

Project Title	Project Purpose	System Need Detail	NWA Project Details	Affected System Components	Project Origination	Planned Wires Option Work	Planned Start Date	NWA Option Status
Bonnet 42F1 NWA	Load Reduction	The Town of Narragansett is mostly supplied by (4) 12.47 kV distribution feeders. Feeder 42F1 is projected to be loaded above summer normal ratings by 2024 and lacks useful feeder ties to reduce loading below their ratings. Either more capacity must be added or load must be reduced in the town.	Load reduction on Bonnet 42 substation, feeder 42F1 to defer or remove the need for feeder line work and reconfiguration.	Bonnet 42F1 feeder	South County East Area Study	Extend the 59F4 out of Peacedale down to the 17F3 and create a new feeder tie, as well as move existing load. Make switching steps to further adjust load on the system.	5/1/2023	No viable bids received
South Kingstown NWA	Load Reduction	The western section of the Town of South Kingston is supplied mostly by (3) 12.47 kV distribution feeders. Two of those feeders (59F3 and 68F2) are projected to be loaded above summer normal ratings and lack useful feeder ties to reduce loading below their ratings. Either new feeder ties must be created or load must be reduced in the western half of the town.	Load reduction on Peacedale 59F3 and Kenyon 69F2 feeders to defer or remove the need for feeder line work and reconfiguration.	Peace Dale 59F3 feeder Kenyon 69F2 feeder	South County East Area Study	Tap existing 68F5 Kenyon Feeder (at Biscuit City Road with new PTR, and extend 20,000' to P12 Tuckertown Road to create a new Normally Open tie point with the 59F3). With this new line extension, load from 68F2 and 59F3 can be transferred to the 68F5, offloading the two overloaded circuits.	6/1/2022	No viable bids received

Appendix 4 – RI NWA BCA Model

The Company is providing Appendix 4 as an Excel file because it is too large to legibly produce as a PDF file.

Appendix 5 – RI NPA BCA Model

The Company is providing Appendix 5 as an Excel file because it is too large to legibly produce as a PDF file.

Appendix 6 – RI NPA BCA Model Technical Reference Manual

Appendix 7 – SRP TWG Topics to Date

Table A7-1: SRP TWG Topics to Date

Year	Month	SRP TWG Topic
2019	March	Discussion of 2019 Marketing and Engagement Plan
2019	March	Discussion of 2019 SRP Portal Work
2019	March	Discussion of SRP Marketing Monthly Reports
2019	March	Discussion of Stakeholder Priorities
2019	March	Overview of 2019 SRP Report to Date
2019	March	Overview of 2020 SRP Report Draft to Date
2019	March	Presentation on System Reliability Procurement
2019	March	Summary of 2018 SRP Plan Results
2019	April	Discussion of Stakeholder Priorities
2019	April	Discussion on NPAs and SRP
2019	April	Discussion on Reason for SRP
2019	April	Discussion on the Enhancement Study
2019	May	Discussion on NWA Market Engagement
2019	May	Discussion on Open RFPs in the Portal
2019	May	Discussion on the Enhancement Study
2019	May	Recap Discussion on Stakeholder Priorities
2019	June	2020 SRP Report First Draft Discussion
2019	June	NWA Process Deep Dive
2019	July	2020 SRP Report First Draft Discussion
2019	July	Rhode Island System Data Portal Demo
2019	July	SRP Market Engagement Deep Dive
2019	August	2020 SRP Report Second Draft Discussion
2019	August	Update on South County East NWA Opportunities
2019	September	2020 SRP Report Third Draft Discussion
2019	September	Starting Discussion on the Standards
2019	November	Electric Forecasting Deep Dive
2020	January	2020 Stakeholder Priorities Discussion
2020	January	NWA Website Introduction
2020	January	SRP Standards Discussion
2020	February	2020 Stakeholder Priorities Discussion
2020	March	RI Test Transmission Capacity as it relates to NWA
2020	March	SRP Commitments
2020	April	Locational incentives
2020	April	SRP Accounting Error
2020	May	Proactive Targeted EE/DR (How can EE be a mitigating measure to reduce NWA/wires need)

Year	Month	SRP TWG Topic
2020	May	Increase stakeholder engagement
2020	May	SRP Locational Incentives, continued
2020	June	Comparison to NY (NWAs)
2020	June	Deferral Value
2020	June	Stakeholder Introductions
2020	July	Bristol 51 NWA Overview
2020	July	NWA RFP improvements Overview
2020	July	SRP 3YP First Draft Overview
2020	July	SRP Locational Incentives, continued
2020	August	NPAs and Gas Discussion
2020	August	SRP 3YP First Draft Discussion
2020	September	Long-Term Capacity Report for Aquidneck discussion
2020	September	Procurement process
2020	September	SRP 3YP Second Draft Discussion
2020	October	Gas considerations, how to use electric to improve gas reliability
2020	October	SRP 3YP Final Draft Presentation
2021	January	2020 SRP Commitments Review
2021	January	AI Long Term Capacity findings and next steps
2021	February	2021 SRP Commitments Preview
2021	February	Electric Forecasting
2021	March	NPA Program Development Update
2021	March	South Kingstown NWA Update
2021	April	2020 SRP Year-End Report Discussion
2021	April	NPA Program Development Update
2021	April	Stakeholder Priorities
2021	May	NPA Program Development Update
2021	May	OER presenting on Optionality
2021	June	NPA Program Development Update
2021	June	Portal Walkthrough
2021	June	SRP Vendor Feedback Survey Results for the Portal
2021	July	CLF's introduction and priorities presentation
2021	July	Locationally-Targeted Outreach for Proactive Targeted EE/DR, Touchbase
2021	July	NPA Program Development Update
2021	July	OER's Presentation on Locational Outreach for EE as an NWA
2021	August	Bonnet 42F1 and South Kingstown NWA Summary Dive
2021	August	NPA Program Development Update
2021	September	2021 SRP Commitments Milestone Review

Year	Month	SRP TWG Topic
2021	September	Rhode Island System Data Portal - Filters Update
2021	October	NPA Program Development Update
2021	October	Rhode Island System Data Portal - Hosting Capacity Nodal Update
2021	November	NPA Program Development Update
2021	November	CommerceRI Introduction
2021	November	RI System Data Portal Updates
2022	January	NPA Program Development Update
2022	January	Docket 5080 SRP Data Requests
2022	January	2021-2023 SPR Commitments Review
2022	February	RI NPA BCA Model Overview
2022	February	PPL Transition Update
2022	April	Stakeholder Priorities (Acadia Center, CLF, Division, NECEC, OER)
2022	May	2021 SRP Year-End Report Revisions Discussion

Appendix 8 – Targeted EE-DR Assessments for South Kingstown and Bonnet 42F1 NWA Opportunities

Appendix 9 – RI NWA BCA Model for the Bonnet 42F1 NWA Opportunity

The Company is seeking confidential treatment of Appendix 9.

The Company is providing Appendix 9 as an Excel file because it is too large to legibly produce as a PDF file.

Appendix 10 – NWA Evaluation Results for the Bonnet 42F1 NWA Opportunity

The Company is seeking confidential treatment of Appendix 10.

The Company is providing Appendix 10 as an Excel file because it is too large to legibly produce as a PDF file.

Appendix 11 – RI NWA BCA Model for the South Kingstown NWA Opportunity

The Company is seeking confidential treatment of Appendix 11.

The Company is providing Appendix 11 as an Excel file because it is too large to legibly produce as a PDF file.

Appendix 12 – NWA Evaluation Results for the South Kingstown NWA Opportunity

The Company is seeking confidential treatment of Appendix 12.

The Company is providing Appendix 12 as an Excel file because it is too large to legibly produce as a PDF file.